United States Environmental Protection Agency
Region 8 Air Program
Air Pollution Control Synthetic Minor Source Permit to Construct
Technical Support Document for
Proposed Permit #SMNSR-UO-000877-2014.001

Berry Petroleum Company, LLC
Section 23 Compressor Station
Uintah and Ouray Indian Reservation
Duchesne County, Utah

In accordance with the requirements of the Tribal Minor New Source Review (MNSR) Permit Program at 40 CFR Part 49, this Federal permit to construct is being issued under authority of the Clean Air Act (CAA). The EPA has prepared this technical support document describing the conditions of this permit and presents information that is germane to this permit action.

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I. Introduction

On March 21, 2014, we received an application from Berry Petroleum Company, LLC (Berry), a wholly owned subsidiary of Linn Energy, requesting a synthetic minor permit for the Section 23 Compressor Station in accordance with the requirements of the MNSR permitting program.

This proposed permit action applies to an existing facility operating on the Uintah and Ouray Indian Reservation in Utah.

This permit does not authorize the construction of any new emission sources, or emission increases from existing units, nor does it otherwise authorize any other physical modifications to the facility or its operations. This permit is only intended to incorporate required and requested emission limits and provisions from the following documents:

A. A September 24, 2013, Federal Combined Complaint and Consent Agreement and Final Order (CAFO) between the EPA and Berry Petroleum Company (Docket No. CAA-08-2013-0014).

   The permit we propose to issue reflects the incorporation of the legally and practically enforceable emissions limitations of the CAFO as it pertains to the Section 23 Compressor Station. Under the CAFO Berry agreed to voluntarily accept enforceable restrictions on its potential to emit at the Section 23 Compressor Station, and to apply for and receive a synthetic minor MNSR permit memorializing those restrictions after termination of the CAFO. The facility is considered an area (minor) source of hazardous air pollutants (HAP) under the National Emissions Standards for Hazardous Air Pollutants, also known as Maximum Achievable Control Technology (MACT), for Oil and Gas Production Facilities at 40 CFR Part 63, Subpart HH (MACT HH), which only requires Berry to optimize the glycol recirculation rate for one (1) affected tri-ethylene glycol (TEG) dehydration system. The CAFO required Berry to route all emissions from the still vent of the TEG dehydrator at the facility to an installed enclosed combustion device, designed, and operated to achieve at least a 95% reduction of volatile organic compounds (VOC) and HAP emissions.

B. The March 21, 2014 permit application from Berry requesting enforceable emission limits and operational restrictions for the Section 23 Compressor Station.

   The permit application requested the following enforceable restrictions on one (1) existing TEG dehydration system in addition to the request to transfer applicable requirements from the CAFO. Specifically, Berry requested a requirement to control TEG dehydrator emissions using an enclosed combustor capable of reducing VOC and total HAP emissions by at least 98%, and requested complimentary VOC and total HAP emission limits on the TEG dehydrator. Because the requested VOC and total HAP reduction requirement for the combustion device is more stringent than the CAFO requirements, the permit we propose to issue will reflect the requested combustion device limitation.

This permit action consolidates the requirements from the CAFO and the limits requested by Berry in the permit application into one document. Upon compliance with this permit, Berry will have legally and practically enforceable requirements to reduce emissions that can be accounted for when determining the applicability of other CAA requirements, such as Prevention of Significant Deterioration (PSD), Part 71, and MACT.

II. Facility Description

The Section 23 Compressor Station consists of equipment designed to compress and dehydrate field natural gas received from the Brundage Canyon natural gas well field. Berry's 9-23X crude oil well pad is also co-located with the facility. Natural gas from the Brundage Canyon well sites enters the facility at a maximum rate of 12 million standard cubic feet per day (MMscfd). The gas feeds to an inlet scrubber (liquid knockout vessel) designed to remove liquids from the inlet natural gas stream (produced water and hydrocarbon liquid condensate). The produced water and condensate are transferred from the inlet scrubber to one of two 400 barrel (bbl) storage tanks and removed from the facility via truck loadout. The natural gas discharged from the inlet scrubber is routed to compression.

Inlet scrubber natural gas is fed to the compressors via a common suction header. Compressor discharge feeds to a discharge separator and coalescing filter for removal of condensed water and compressor oils. Filter overhead natural gas is fed through an amine liquid-filled vessel to remove trace amounts of hydrogen sulfide (H_2S) and then to a 12 MMscfd TEG dehydration system. The dehydration system removes water vapor from the natural gas and treated natural gas discharges to a separator and then to a sales pipeline. The dehydration system is equipped with a flash tank, and off gas from the flash tank is routed to the facility inlet scrubber. The still vent on the dehydration system is routed to an enclosed combustor to thermally oxidize VOC, organic HAP, and methane.

Water and hydrocarbon liquid condensate that condenses in compressor coolers is recycled back to the inlet scrubber where flash vapors are recovered and added to the compressor inlet volumes. Liquids from the inlet scrubber are routed to two 400 bbl storage tanks and loaded onto trucks for sales.

Each compressor is powered by a 4-stroke lean-burn (4SLB) reciprocating internal combustion engine. All fuel-burning equipment is fired by natural gas which has passed through the amine liquid vessel to remove any sulfur. The facility is designed to operate continuously throughout the year.

Crude oil and fresh water production are also located within the boundaries of the facility. Oil is pumped from the well using a 4SLB natural gas-fired pump jack engine into two heated 400 bbl storage tanks before being trucked out for sales. A 4-stroke rich-burn (4SRB) natural gas-fired generator powers a submersible pump which sends water to a nearby water flood (injection) facility.

The emission units identified in Table 1 are currently installed and operating at the facility. The details provided in this table are for informational purposes only and are not intended to be viewed as enforceable restrictions or open for public comment. The units and control requirements identified here either existed prior to any pre-construction permitting requirements or were approved/required through the mechanism identified. Table 2, Facility-wide Emissions, provides an accounting of uncontrolled and controlled emissions in tons per year (tpy).

Table 1. Existing Emission Units

Unit Description	Controls	Original Preconstruction Approval Date &/or Approval Details
Two (2) 4SLB, natural gas-fired compressor engines with a maximum site rating of 1,209 hp each.	None	No pre-construction approval required for the installation of the engines. Installed prior to the promulgation of the MNSR Permit Program.
One (1) 4SLB, natural gas-fired oil pump jack engine with a maximum site rating of 40 hp.	None	No pre-construction approval required for the installation of the engine. Installed prior to the promulgation of the MNSR Permit Program.
One (1) 4SRB, natural gas-fired generator engine with a maximum site rating of 72 hp.	None	No pre-construction approval required for the installation of the engine. Installed prior to the promulgation of the MNSR Permit Program.
Two 400 bbl* atmospheric condensate production storage tanks.	None	No pre-construction approval required for the installation of the storage tanks. Installed prior to the promulgation of the MNSR Permit Program.
Two 400 bbl* atmospheric crude oil production storage tanks.	None	No pre-construction approval required for the installation of the storage tanks. Installed prior to the promulgation of the MNSR Permit Program.
One 12 MMscfd* tri-ethylene glycol (TEG) dehydration system consisting of: One 0.25 MMBtu/hr TEG reboiler; One TEG/gas separation unit; One flash tank; and One 3.50 gallon per minute (gpm) TEG pump.	400 Btu/scf* Enclosed Combustor	No pre-construction approval required for the installation of the TEG dehydration system. Installed prior to the promulgation of the MNSR Permit Program. Control requirements established in the September 30, 2013 CAFO No. CAA-08-2013-0014. Stricter control requirements requested and proposed to be established through this permit action.
One (1) condensate truck-loading station.	None	No pre-construction approval required for the installation of the truck loading rack. Installed prior to the promulgation of the MNSR Permit Program.
One (1) crude oil truck-loading station.	None	No pre-construction approval required for the installation of the truck loading rack. Installed prior to the promulgation of the MNSR Permit Program.
Compressor Blowdown Events.	None	No pre-construction approval required for the compressor blowdown events. Compressors installed prior to the promulgation of the MNSR Permit Program.

Unit Description	Controls	Original Preconstruction Approval Date &/or Approval Details
Compressor Rod Packing Vents.	None	No pre-construction approval required for the compressor rod packing vents. Compressors installed prior to the promulgation of the MNSR Permit Program.
Starter Gas.	None	No pre-construction approval required for the compressor starter gas. Compressors installed prior to the promulgation of the MNSR Permit Program.
Equipment Leaks.	None	No pre-construction approval required for the equipment leaks. Facility constructed prior to the promulgation of the MNSR Permit Program.

* bbl = barrel; MMBtu/hr = million British thermal units per hour; MMscfd = million standard cubic feet per day.

Table 2. Facility-wide Emissions

Pollutant	Uncontrolled Potential Emissions (tpy)	Controlled Potential Emissions (tpy)
PM	NA	NA
PM_{10}	NA	NA
$PM_{2.5}$	NA	NA
SO_2	NA	NA
NO_X	42.38	42.42
CO	77.14	77.18
VOC	43.95	29.48
Greenhouse Gases		
CO_2 (mass basis)	13,644.00	13,666.00
CH_4 (mass basis)	89.66	86.22
N_2O (mass basis)	0.02	0.02
HFCs (mass basis)	NA	NA
PFCs (mass basis)	NA	NA
SF_6 (mass basis)	NA	NA
GHG_{total} (mass basis)	13,733.68	13,752.24
CO_2e (Total)	**15,877.00**	**15,826.00**
Hazardous Air Pollutants (HAP)		
Acetaldehyde	0.78	0.78
Acrolein	0.50	0.50
Benzene	2.90	0.19
Ethyl-Benzene	0.01	0.01
Toluene	0.47	0.10
n-Hexane	1.45	0.65
Xylene	0.27	0.04
Formaldehyde	7.29	7.29
2,2,4-Trimethylpentane	0.03	0.00
Cyclohexane	NA	NA
Total HAP*	**13.92**	**9.88**

PM – Particulate Matter
PM_{10} – Particulate Matter less than 10 microns in size
$PM_{2.5}$ – Particulate Matter less than 2.5 microns in size
SO_2 – Sulfur Dioxide
NO_X – Nitrogen Oxides
CO – Carbon Monoxide
VOC – Volatile Organic Compounds
CO_2 – Carbon dioxide
CH_4 – Methane
N_2O – Nitrous oxide
HFCs – Hydrofluorocarbons
PFCs – Perfluorocarbons
SF_6 – Sulfur hexafluoride
CO_2e – Equivalent CO_2. A measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP)

HFCs, PFCs, and SF_6 emissions are not created during oil and natural gas production operations.

NA – Not Available

*Total HAPs is inclusive of, but not limited to the individual HAPs listed above.

III. Proposed Synthetic Minor Permit Action

A. Dehydration System and Controls

The natural gas industry commonly uses the glycol absorption process to remove naturally occurring water from raw natural gas. Most commonly, the glycol absorbent used is TEG. The TEG dehydration process produces VOC and HAP emissions from pressure reduction of rich glycol (immediately post absorption and prior to stripping and regeneration) and from the stripping of the rich glycol to regenerate lean glycol to be reused in the process. The HAP emissions consist primarily of n-hexane, benzene, toluene, ethylbenzene and xylenes.

The primary form of emission control is to capture and route the emissions from the still vent through a closed-vent system to an enclosed combustor, flare, or other combustion device to destroy the hydrocarbon content of the vapors. As required by the CAFO, Berry uses an enclosed combustion device designed and operated to destroy at least 95% of the VOC and total HAP emissions from the still vent. Berry has requested enforceable permit restrictions on the dehydration system to permanently recognize the use of the enclosed combustion device, as designed and operated to meet the manufacturer guaranteed 98% VOC and HAP destruction efficiency. Berry requested VOC and total HAP emission limits to accompany the requirement to reduce emissions by 98%. Because the requested emission restrictions are stricter than what is required in the CAFO, we are proposing that Berry demonstrate that the enclosed combustion device achieves a 98% VOC and HAP destruction efficiency and meets the requested VOC and total HAP emission limits.

We are also proposing the emission, operational, testing, monitoring, recordkeeping, and reporting requirements in Table 3 for the dehydration system and enclosed combustion device. The proposed requirements are consistent with MACT HH, and we added any necessary additional testing, monitoring, and recordkeeping requirements, pursuant to 40 CFR 49.151(ii)(C), to ensure that the requested emission limits are legally and practically enforceable.

Table 3. Proposed Dehydration System Emission, Operational, Testing, Monitoring, Recordkeeping, and Reporting Requirements

Type	**Proposed Requirement**
Construction and Operation	Route all emissions from the still vent to an enclosed combustion device capable of reducing uncontrolled VOC and total HAP emissions by at least 98% by weight and capable of meeting the VOC and HAP emission limits in the permit
Emission Limits	Limit emissions from the still vent and enclosed combustion device to: • VOC: 0.38 tpy • Total HAP: 0.14 tpy
Performance Testing	Initial performance test using EPA Reference Methods

	Subsequent performance tests every 36 months thereafter (unless model tested and meet criteria at 40 CFR 63.772(h)) Performance test after startup of each rebuilt or replaced enclosed combustion device (or model test by manufacturer under and meeting criteria of 40 CFR 63.772(h))
Monitoring	Monthly and bi-annual inspections according to manufacturer recommendations Weekly pilot light inspection Weekly visible emissions inspection
Recordkeeping	Keep records of all VOC and total HAP monthly and 12-month rolling emissions calculations, and all maintenance, inspection, and performance testing conducted
Reporting	Submit a summary of all monthly and 12-month rolling VOC and total HAP emissions calculations and all maintenance, inspections, and performance tests conducted in each annual report to the EPA

Table 4 below summarizes the emissions for the dehydration system and the effect of the proposed enforceable permit restrictions on the potential to emit (PTE) for that emissions unit, based on the information provided by Berry in the permit application.

Table 4. Dehydration System Still Vent Emissions Summary

Pollutant	**Uncontrolled Emissions (tpy)**	**Controlled PTE with Enforceable Emission Limits (tpy)**	**Net Change (tpy)**	**Emission Reduction with Enforceable Controls (%)**
	PTE	***Allowable/PTE***		
VOC	10.02	0.38	-9.64	96*
HAP	3.72	0.14	-3.58	96*

**Note: The dehydration system is currently subject to the area source requirements under MACT HH, found at 40 CFR 63.764(d)(2), which requires Berry to optimize the TEG circulation rate. According to Berry's permit application, the optimum TEG circulation pump rate is 1.86 gallons per minute (gpm), which was used to calculate the uncontrolled PTE. The requested enforceable restrictions would allow the dehydration system to qualify for the emission control exemption at 40 CFR 63.764(e)(1)(ii). Therefore, although the enclosed combustion device manufacturer guarantees 98% VOC (including all HAP emitted) and CH_4 destruction efficiency, the controlled PTE reported above were calculated using the maximum glycol circulation rate, per the MACT HH exemption provision at 40 CFR 63.760(e)(2)(ii), which is 3.50 gpm and results in a 96% VOC and HAP reduction when compared to the uncontrolled PTE.*

The proposed emission restrictions will result in a total of 0.38 tpy of VOC and 0.14 tpy of total HAP from the dehydration system. These controlled emissions are based on the dehydration system operating a maximum of 8,760 hours in a year, at a maximum capacity of 12 MMscfd, and maximum glycol recirculation pump rate of 3.5 gpm.

IV. Air Quality Review

The MNSR regulations at 40 CFR 49.154(d) require that an Air Quality Impact Assessment (AQIA) modeling analysis be performed if there is reason to be concerned that new construction would cause or contribute to a National Ambient Air Quality Standard (NAAQS) or PSD increment violation. If an AQIA reveals that the proposed construction could cause or contribute to a NAAQS or PSD increment violation, such impacts must be addressed before a pre-construction permit can be issued.

The emissions at this existing facility will not be increasing due to this permit action, and the emissions will continue to be well controlled at all times. In addition, this permit action does not authorize the construction of any new emission sources, or emission increases from existing units, nor does it otherwise authorize any other physical modifications to the facility or its operations and the substantive requirements of the CAFO (emission controls and reductions) have already been fulfilled at this facility. In short, this action will have no adverse air quality impacts; therefore, we have determined that an AQIA modeling analysis is not required for this action.

V. Tribal Consultations and Communications

We offer tribal government leaders an opportunity to consult on each permit action. We ask the tribal government leaders to respond to our offer to consult within 30 days of receiving the offer. We offered the Chairperson of the Ute Tribe an opportunity to consult on this permit action via letter dated February 5, 2015. To date, the EPA has not received a request for such consultation.

All minor source applications (synthetic minor, minor modification to an existing facility, new true minor, and general permit) are submitted to both the tribe and the EPA per the application instructions (see http://www2.epa.gov/region8/tribal-minor-new-source-review-permitting). The tribe has 10 business days from the receipt of the application to communicate to the EPA any preliminary questions and comments on the application. In the event an AQIA is triggered, we email a copy of that document to the tribe within 5 business days from the date that we receive it.

Additionally, we notify the tribe of the public comment period for the proposed permit and provide copies of the notice of public comment opportunity to post in various locations of their choosing on the Reservation. We also notify the tribe of the issuance of the final permit.

VI. Environmental Justice

On February 11, 1994, the President issued Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The Executive Order calls on each federal agency to make environmental justice a part of its mission by “identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations.”

The EPA defines “Environmental Justice” to include meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and

enforcement of environmental laws, regulations, and polices. The EPA's goal is to address the needs of overburdened populations or communities to participate in the permitting process. *Overburdened* is used to describe the minority, low-income, tribal and indigenous populations or communities in the United States that potentially experience disproportionate environmental harms and risks due to exposures or cumulative impacts or greater vulnerability to environmental hazards.

This discussion describes our efforts to identify environmental justice communities and assess potential effects in connection with issuing this permit in Duchesne County, Utah, within the exterior boundaries of the Uintah and Ouray Indian Reservation.

A. Environmental Impacts to Potentially Overburdened Communities

This permit action does not authorize the construction of any new air emission sources, or air emission increases from existing units, nor does it otherwise authorize any other physical modifications to the associated facility or its operations. The air emissions at the existing facility will not increase due to the associated action and the emissions will continue to be well controlled at all times. This action will have no adverse air quality impacts.

Furthermore, the permit contains a provision stating, "*The permitted source shall not cause or contribute to a National Ambient Air Quality Standard violation or a PSD increment violation.*" Noncompliance with this permit provision is a violation of the permit and is grounds for enforcement action and for permit termination or revocation. As a result, we conclude that issuance of the aforementioned permit will not have disproportionately high or adverse human health effects on communities in the vicinity of the Uintah and Ouray Indian Reservation.

B. Enhanced Public Participation

Given the presence of potentially overburdened communities in the vicinity of the facility, we are providing an enhanced public participation process for this permit.

1. Interested parties can subscribe to an EPA listserve that notifies them of public comment opportunities on the Uintah and Ouray Indian Reservation for proposed air pollution control permits via email at http://www2.epa.gov/region8/air-permit-public-comment-opportunities.

2. All minor source applications (synthetic minor, modification to an existing facility, new true minor or general permit) are submitted to both the tribe and the EPA per the application instructions (see http://www2.epa.gov/region8/tribal-minor-new-source-review-permitting).

3. The tribe has 10 business days to communicate to the EPA any preliminary questions and comments on the application.

4. In the event an AQIA is triggered, we email a copy of that document to the tribe within 5 business days from the date we receive it.

5. We notify the tribe of the public comment period for the proposed permit and provide copies of the notice of public comment opportunity to post in various locations of their choosing on the Reservation. We also notify the tribe of the issuance of the final permit.

6. We offer the tribal government leaders an opportunity to consult on each proposed permit action. The tribal government leaders are asked to respond to the EPA's offer to consult within 30 days of receiving the letter.

VII. Authority

Requirements under 40 CFR Part 49 to obtain a permit apply to new and modified minor stationary sources, and minor modifications at existing major stationary sources ("major" as defined in 40 CFR 52.21). In addition, the MNSR permitting program provides a mechanism for an otherwise major stationary source to voluntarily accept restrictions on its potential to emit to become a synthetic minor source. We are charged with direct implementation of these provisions where there is no approved Tribal implementation plan for implementation of the MNSR regulations. Pursuant to Section 301(d)(4) of the CAA (42 U.S.C. Section 7601(d)), we are authorized to implement the MNSR regulations at 40 CFR Part 49 in Indian country. The Section 23 Compressor Station is located within the exterior boundaries of the Uintah and Ouray Indian Reservation in Utah. The exact location is Latitude 40.02993, Longitude -110.40752, in Duchesne County, Utah.

VIII. Public Notice

A. Public Comment Period

In accordance with 40 CFR 49.157, we must provide public notice and a 30-day public comment period to ensure that the affected community and the general public have reasonable access to the application and proposed permit information. The application, the proposed permit, this technical support document, and all supporting materials for the proposed permit are available at:

Ute Indian Tribe
Environmental Programs Office
910 South 7500 East
Fort Duchesne, Utah 84026

and

U.S. EPA
Region 8 Air Program Office
1595 Wynkoop Street (8P-AR)
Denver, Colorado 80202-1129

All documents are available for review at our office Monday through Friday from 8:00 a.m. to 4:00 p.m. (excluding Federal holidays). Additionally, the proposed permit and technical support document can be reviewed on our website at: http://www2.epa.gov/region8/air-permit-public-comment-opportunities.

Any person may submit written comments on the proposed permit and may request a public hearing during the public comment period. These comments must raise any reasonably ascertainable issues with supporting arguments by the close of the public comment period (including any public hearing). Comment may be sent to the EPA address above, or sent via an email to r8airpermitting@epa.gov, with the topic "Comments on SMNSR Permit for the Berry Petroleum Section 23 Compressor Station".

B. Public Hearing

A request for a public hearing must be in writing and must state the nature of the issues proposed to be raised at the hearing. We will hold a hearing whenever there is, on the basis of requests, a significant degree of public interest in a proposed permit. We may also hold a public hearing at our discretion, whenever, for instance, such a hearing might clarify one or more issues involved in the permit decision.

C. Final Permit Action

In accordance with 40 CFR 49.159, a final permit becomes effective 30 days after permit issuance, unless: (1) a later effective date is specified in the permit; (2) appeal of the final permit is made as detailed in the next section; or (3) we may make the permit effective immediately upon issuance if no comments resulted in a change or denial of the proposed permit. We will send notice of the final permit action to any individual who commented on the proposed permit during the public comment period. In addition, the source will be added to a list of final permit actions which is posted on our website at: http://www2.epa.gov/region8/nsr-and-psd-permits-issued-region-8. Anyone may request a copy of the final permit at any time by contacting the Tribal Air Permit Program at (800) 227–8917 or sending an email to r8airpermitting@epa.gov.

D. Appeals to the Environmental Appeals Board

In accordance with 40 CFR 49.159, within 30 days after a final permit decision has been issued, any person who filed comments on the proposed permit or participated in the public hearing may petition the Environmental Appeals Board (EAB) to review any condition of the permit decision. The 30-day period within which a person may request review under this section begins when we have fulfilled the notice requirements for the final permit decision. Motions to reconsider a final order by the EAB must be filed within 10 days after service of the final order. A petition to the EAB is under Section 307(b) of the CAA, a prerequisite to seeking judicial review of the final agency action. For purposes of judicial review, final agency action occurs when we issue or deny a final permit and agency review procedures are exhausted.